R E P O R T R E S U M E S

ED 017 432 RE 001 159

RELATIONSHIPS BETWEEN AUDITORY AND VISUAL PERCEPTUAL ABILITY AND READING ACHIEVEMENT.

BY- BUSBY, WALTER A. HURD, DONALD E.

PUB DATE FEB 68

EDRS PRICE MF-$0.25 HC-$0.36 7P.

DESCRIPTORS- *PERCEPTION, *READING ACHIEVEMENT, *GRADE 2, *GRADE 4, *GRADE 6, AUDITORY PERCEPTION, VISUAL PERCEPTION, INTELLIGENCE,

A STUDY WAS CONDUCTED TO DETERMINE WHETHER AUDIOVISUAL PERCEPTUAL ABILITY CAN ACCOUNT FOR READING ACHIEVEMENT. SUBJECTS WERE 120 PUPILS SELECTED RANDOMLY FROM 38 SCHOOLS IN ILLINOIS. PUPILS WERE IN GRADES 2, 4, AND 6. MEASURES OF VISUAL PERCEPTION, AUDITORY PERCEPTION, VISUAL-AUDITORY SHIFTING PERCEPTION, INTELLIGENCE, SOCIOECONOMIC STATUS, AND READING ACHIEVEMENT WERE OBTAINED FOR ALL SUBJECTS. THE REACTION TIME TO VISUAL AND AUDITORY STIMULI WAS MEASURED. CORRELATION AND MEAN SCORES WERE USED TO ANALYZE THE DATA. SHIFTING BEHAVIOR WAS NOT INDEPENDENT OF THE ABILITY TO RESPOND TO A SINGLE CHANNEL STIMULI. AUDIOVISUAL PERCEPTION AND INTELLIGENCE WERE NOT SIGNIFICANTLY RELATED. SCORES IN RESPONSE TO THE AUDIOVISUAL STIMULI WERE NOT RELATED TO READING ACHIEVEMENT. AUDITORY-VISUAL PERCEPTUAL ABILITY INCREASED WITH AGE, BUT WAS NOT SIGNIFICANTLY RELATED TO SEX, RACE, INTELLIGENCE, OR SOCIOECONOMIC STATUS. REFERENCES ARE INCLUDED. THIS PAPER WAS PRESENTED AT THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION CONFERENCE (CHICAGO, FEBRUARY 6-10, 1968). (BK)

HEALTH, EDUCATION & WELFARE
OF EDUCATION

DUCED EXACTLY AS RECEIVED FROM THE
NATING IT. POINTS OF VIEW OR OPINIONS
PRESENT OFFICIAL OFFICE OF EDUCATION

RELATIONSHIPS BETWEEN AUDITORY AND VISUAL PERCEPTUAL ABILITY AND READING ACHIEVEMENT

AERA Conf. Chicago

Walter A. Busby and Donald E. Hurd
Bradley University

ED017432

Research attention in recent years has been directed at establishing a relationship between perception and reading. An underlying assumption of most of this research is that every individual possesses a perceptual mechanism that functions independently of intellectual ability. Hence, perceptual difficulty could account for many reading and learning problems.

A major obstacle in conducting research in this area has been the confusion and disagreement as to what perception is. Travers (1967) has recently added clarity to the field by suggesting that perception can be classified into three categories:

1. Information contained in a perceptual field.
2. Information that is selected from a perceptual field and stored.
3. Information that is selected from a perceptual field and hooked up with previously stored information.[1]

The present study is concerned with the first category of perception. More specifically, the purpose of this study is to determine if there is a relationship between the ability of an individual to respond to auditory and visual stimuli in his perceptual field.

RE 001 159

Both auditory and visual perception have been examined in relationship to reading achievement (Beery, 1967; Frostig, 1963; Goins, 1958; Olson, 1966; Rudnick, 1966). In addition, the possibility that perceptual difficulties could exist in shifting from one sense channel to the other while no defect exists in either single channel, has also been studied (Raab, 1960; Sutton, 1961; Katz, 1963).

---

1. Many would consider this last category of Travers' model as cognition and therefore distinct from perception.

While the majority of research suggests that reading achievement and auditory-visual perception are related, it is difficult to draw definite conclusions because of the lack of uniformity in instrumentation and research design. Also, these studies have primarily been concerned with perceptual differences between the extremes of high and low reading ability groups.

The present study differs from the previous research in that it will attempt to determine if audio-visual perceptual ability can account for reading achievement in a representative population. In addition, control for the intervening variables of sex, race, and socio-economic status have been incorporated into the design of the study. The study will test the following hypotheses:

1. There is a relationship between the ability to shift from the auditory and visual channels and the ability to react to stimuli in the same channel.

2. There is a relationship between the ability to respond to auditory and visual stimuli and reading achievement.

3. There is a relationship between auditory and visual perceptual ability and the variables of race, sex, age, socio-economic status and intelligence.

PROCEDURE

Population and Sample

Subjects for study were selected at random from thirty-eight public elementary schools in Peoria, Illinois. In all, 120 students were chosen, 40 each (20 girls and 20 boys) from grades two, four, and six. Measures of the following variables were collected on each student in the sample:

1. Visual perception

2. Auditory perception

3. Visual-auditory shifting perception

4. Intelligence (Wechsler Intelligence Scale for Children)

5. Socio-economic status (Socio-Economic Scale, Reiss, 1961)

6. Reading achievement (California Achievement Test - Reading, Series WXYZ, 1963 norms)

Apparatus

The perceptual apparatus used in this experiment has been described earlier by Sutton, et al (1961) and differs only in equipment design. The stimuli consisted of a red light, green light, and low and high tones of 400 cps and 1200 cps. Presentation was automatic with random interval timing of 1.5, 2.0, and 3.0 seconds. Six blocks of thirty-three trials each for a total of 198 trials were presented to the subjects, with a one minute delay between each block. The subject responded by lifting his finger from a key and the reaction time was automatically recorded on tape. Mean reaction times were then computed for (a) stimuli preceded by a stimuli in the same sense channel and (b) stimuli preceded by a stimuli in a different sense channel.

RESULTS

Hypothesis #1

Pearson's product moment correlation coefficient was computed between the ability to shift from the auditory and visual channels and the ability to respond to a stimuli in the same sense channel. The coefficients were .969 (auditory) and .970 (visual). These unusually high coefficients would suggest that shifting behavior is not independent of the ability to respond to a stimuli in a single channel.

Hypothesis #2

Correlation coefficients were also computed between auditory-visual perception and reading achievement (Table 1). The resulting coefficients ranging from -.272 to .256 were not significant at the .05 level. It is interesting to note that auditory-visual perception and intelligence were not significantly related. This would support the assumption that perception is independent of intelligence.

Hypothesis #3

A comparison of mean auditory-visual perceptual scores between the 2nd and th grade indicated a significant difference at the .02 level (Table 2). This

TABLE #1

CORRELATION OF AUDITORY-VISUAL
PERCEPTION TO READING ACHIEVEMENT AND INTELLIGENCE

	2nd Grade N = 40	4th Grade N = 40	6th Grade N = 40
Reading Vocabulary	-.198	.233	-.188
Reading Comprehension	-.128	.256	-.272
Intelligence	-.073	.057	-.277

P = .05 = .304, P = .01 = .393

TABLE #2

MEAN AUDITORY-VISUAL PERCEPTUAL SCORES
BY SEX, GRADE, RACE & SOCIO-ECONOMIC STATUS

				t	P
SEX	Male N = 60 .363	Female N = 60 .373		.060	NS
RACE	Negro N = 20 .371	White N = 100 .353		.78	NS
GRADE	2nd Grade N = 40 .434*	4th Grade N = 40 .357	6th Grade N = 40 .314*	2.43	.02
SOCIO-ECONOMIC STATUS	Low N = 37 .368	Med N = 44 .375*	High N = 39 .355*	.995	NS

* Test computed between highest and lowest mean

would suggest that auditory-visual perceptual ability increases with age. Conversely, auditory-visual perceptual ability was found to be independent of sex, race, and socio-economic status.

CONCLUSION

Perception as measured by the ability to respond to auditory-visual stimuli was found not to be significantly related to reading achievement for the sample tested. This finding appears to contradict the results of previous research. However, while earlier studies suggest that perceptual differences exist between samples of high and low reading ability groups, it could be possible that perceptual differences in a representative sample are minimal.

The ability to respond to stimuli in the same sense channel and the ability to shift from one sense channel to another was so closely related that it can be concluded that they are the same variable.

Auditory-visual perceptual ability was found to increase with age, but was not significantly related to sex, race, intelligence, or socio-economic status.

As stated earlier, there is considerable confusion and disagreement in the area of perception due to the lack of operational definitions. The present study has been limited to perception identified as the ability of an individual to respond or react to stimuli present in his perceptual field. The instrument used in this study attempted to measure an individual's reaction time to these stimuli. Perception has also been identified as the ability to select information contained in a perceptual field. Instruments such as the Developmental Test of Visual Perception, developed by Marianne Frostig, measure an individuals ability to discriminate between information contained in his perceptual field.

Perhaps the distinction between these two approaches to perception will aid the reader in interpreting conclusions in this area. Further, perhaps future research could profit by developing instruments that would combine measures of both approaches.

REFERENCES

Beery, Judith Williams. "Matching of Auditory and Visual Stimuli by Average and Retarded Readers." Child Development, 38:827-31. September 1967.

Frostig, Marianne (et.al.). "Disturbances in Visual Perception." Journal of Educational Research, 57:160-2. November 1963.

Goins, Jean Turner. Visual Perceptual Abilities and Early Reading Progress. Supplementary Educational Monographs No. 87. University of Chicago Press, 1958.

Katz, P.A. and M. Deutsch. "Relation of Auditory-Visual Shifting to Reading Achievement." Perceptual and Motor Skills, 17:327-32, 1963.

Olson, Author. "The Frostig Developmental Test of Visual Perception as a Predictor of Specific Reading Abilities With Second Grade Children." Elementary English, 43:869-72. December 1966.

Raab, S. (et. al.). "Perceptual Shifting and Set in Normal School Children of Different Reading Achievement Levels." Perceptual and Motor Skills, 10:187-92, 1960.

Reiss, Albert Jr. Occupations and Social Status. The Free Press at Glencoe, Inc. 1961.

Rudnick, Mark and Graham M. Stevvitt. "Auditory and Visual Rhythm Perception and Reading Ability." Child Development, 22:253-59, 1966.

Sutton, S. (et. al.). "The Effect of Shift of Sensory Modality on Serial Reaction Time: A Comparison of Schizophrenics and Normals. American Journal of Psychology, 74:242-32, 1961.

Travers, Robert M. "Perceptual Learning." Review of Educational Research, 37:600, December, 1967.